DOCUMENT RESUME

ED 040 798 24 RC 004 442

AUTHOR Havighurst, Robert J.
TITLE Mental Development and School Achievement of American Indian Children and Youth. The National Study of American Indian Education, Series IV, No. 3, Final Report.
INSTITUTION Chicago Univ., Ill.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO BR-8-0147
PUB DATE Jun 70
CONTRACT OEC-0-8-080147-2805
NOTE 15p.

EDRS PRICE EDRS Price MF-$0.25 HC-$0.85
DESCRIPTORS *Academic Achievement, *American Indians, Early Childhood Education, Economically Disadvantaged, *Education, Environmental Influences, Language Handicapped, Non English Speaking, *Socioeconomic Background, Testing, *Underachievers

ABSTRACT

As a part of the Final Report of the National Study of American Indian Education, this study points out that there are no reasons to suppose that Indian children are basically or genetically less or more intelligent than other children. It is noted that the low achievement of the Indian children at certain grade levels is related to the child's limited experiences and is compounded by the family's socioeconomic circumstances. The study points out that most studies (except 2) place Indian children just below the national norms during the first few grades. Evidence derived from this study is presented in tables. Conclusions point out that the pattern of low achievement of the Indian children is similar to that of other low-income and non-English-speaking children. (EL)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

BR 8 0147
PA-24
RC

ED040798

The National Study of American Indian Education

RECEIVED
JUL 10 1970
NMSU
E.R.I.C.

MENTAL DEVELOPMENT AND SCHOOL ACHIEVEMENT OF AMERICAN INDIAN CHILDREN AND YOUTH

USOE
No. OEC-0-8-08147-2805

Final Report

Series IV. No. 3

By Robert J. Havighurst

June, 1970

RC004442

NATIONAL STUDY OF AMERICAN INDIAN EDUCATION

The attached paper is one of a number which make up the Final Report of the National Study of American Indian Education.

This Study was conducted in 1968-69-70 with the aid of a grant from the United States Office of Education, OEC-0-8-080147-2805.

The Final Report consists of five Series of Papers:

I. Community Backgrounds of Education in the Communities Which Have Been Studied.

II. The Education of Indians in Urban Centers.

III. Assorted Papers on Indian Education--mainly technical papers of a research nature.

IV. The Education of American Indians--Substantive Papers.

V. A Survey of the Education of American Indians.

The Final Report Series will be available from the ERIC Document Reproduction Service after they have been announced in Research in Education. They will become available commencing in August, 1970, and the Series will be completed by the end of 1970.

It is generally known that Indian children do not achieve as well on tests of school achievement as do the children of the white majority. There are many publications which have reported this fact, from as long as 40 years ago until today.

There is no reason to suppose that Indian children are basically or genetically less or more intelligent than other children in America. There is much general evidence that all large groups of human children (grouped by nationality, or by skin color, or by socioeconomic status) have the same intelligence and ability to learn, on the average.

Several studies of mental alertness and of basic mental development have been made with Indian children, and these studies show the Indian children to be about the same as white children of the surrounding society. For example, on the Good-enough Draw-a-Man Intelligence Test, which is a test of mental alertness and does not require language, Indian children show about the same level of achievement as white children. Actually, the 1700 Indian children who took this test recently under the auspices of the National Study of American Indian Education made an average IQ of 101.5, which is slightly but definitely superior to the average of white children.(10)

On the Grace Arthur Performance Test of Intelligence (a battery of non-verbal tests), in a study made in 1942, a representative sample of Indian pupils from six tribes made an average IQ score of 100.2, slightly above the national average for whites.(7) As part of this study, a group of 30 Sioux pupils on the Pine Ridge Reservation made an average IQ score of 102.8, while exactly the same group, tested a year later with the Kuhlmann-Anderson, a verbal test requiring reading ability, made an average IQ score of 82.5.

Recently a study was made of 75 Oglala Sioux children aged 4-10 on the Pine Ridge Reservation. These children were given a standard set of test exercises developed by the Swiss psychologist, Piaget. The same tests had been given to a typical group of Swiss children in Geneva, Switzerland. These tests are used to measure the level of mental development, which Piaget believes is a universal process among human children. The Sioux and the Swiss children were practically identical in their performance. Voyat, the researcher, concluded: "The inferiorities shown by IQ tests among Indian children are dependent upon the nature of the tests themselves, in particular their cultural content, since these inferiorities are not found when one analyzes the development of more fundamental concepts."(12)

It follows from these considerations that the lower average school achievement of Indian children must be due to some combination of their experience in their homes and in their schools. School achievement is well known to be related to a child's experience in his family, to his school experience, and to his inherited intellectual ability. Since the Indian children do not differ from other groups of children in their inherited intellectual ability as far as we know, group differences in school achievement must be due to the family or the school factors.

The Family and Local Community Factor

There is abundant evidence that the school achievement of children depends to a large extent on their experience in their family and their local community or neighborhood. If their parents read widely, read to them, use large vocabularies while conversing at home, take them to museums, provide children's encyclopedias in the home, and set examples of educated behavior, the children will generally follow in their footsteps. On the other hand, if the parents do not read or read very little, do not speak English, do not use complex sentences or express themselves in complicated ways, their children are likely to be slow in learning to read, and consequently retarded in the other school subjects. They are even more likely to achieve poorly in school if they live in a community or neighborhood characterized by poverty.

In general, as the work of Bloom,(1) Deutsch,(5) and many other students of child development shows, there is a close relation between the socioeconomic status of a family and the school achievement of its children. Coleman,(3) in the national study of educational achievement, found the socioeconomic status of the home to be the most powerful factor in predicting the child's school achievement.

The results of a number of studies of disadvantaged children are summarized by Hess and Shipman(9) as follows:

> Children from deprived backgrounds score well below middle-class children on standard individual and group measures of intelligence (a gap that increases with age), they come to school without the skills necessary for coping with first grade curricula; their language development, both written and spoken, is relatively poor; auditory and visual discrimination skills are not well developed; in scholastic achievement they are retarded an average of two years by grade six and almost three years by grade eight; they are more likely to drop out of school before completing a secondary education; and even when they have adequate ability, are less likely to go to college.

Since most Indian children are raised in poor families, by parents who read little or not at all, and since most Indian children live in communities of poor people, we should expect them, like the children of poor whites, or blacks, or Spanish-Americans, to do poorly in school, on the average. However, we should expect a good performance from a minority of Indian children, as we do from the children of other disadvantaged families.

The School Achievement Graph. In order to examine and to understand the actual data on school achievement it is necessary to consider the way the test results of Indian children are represented in relation to the test results of American children in general. One method is to compare the average scores of a sample of Indian children with the average of a national sample of American children on the same test given to both groups of children. In this case the data may be placed on a school achievement graph, which is presented in Fig. 1. From the test scores of the national sample, we obtain the average scores of pupils at various age and grade levels. Thus we determine, for example, the average scores of pupils at age 9, 9.5, 10, 10.5, 11, 11.5, etc., and for grades 4, 5, 6, etc., as well as for a school grade in the middle of the school year, which would be grade 4.5, 5.5, etc. With these data, we can place a sample of Indian pupils of a given age or grade upon a graph to show how they stand with reference to a national

sample of American pupils. The national sample is represented in Fig. 1 by the line labeled 1.0, which means that the ratio of achievement in age or grade-equivalent scores to actual age or grade is 1. A group to be compared with the national norms will be located above or below this line, dependent on its achievement relative to the national average.

The actual location of several samples of Indian pupils on such a graph is shown in Fig. 2. Generally, the Indian pupils score below the line representing the national norm. If a group of Indian pupils aged about 10 are one year behind the national average, their test score will be 9.0, or the same as the national average for 9-year-olds. If this group continue to learn at this slower rate, they would average 13.5 year-equivalents when they were 15 years old. That is, their test scores would stay on a straight line below the line representing the national average. To put it another way, we might say that they have an achievement quotient of 0.90.

This is an important concept, which is not always understood by people who write and speak about the school achievement of disadvantaged pupils. They tend to misinterpret the data when they say: "The Indian children are one year (or one grade) behind the national average at the age of ten, and they fall further behind, so that they are 1.5 years below the national average at age 15." This seems to mean, to them, that the pupils or the schools have done even worse after age 10 than before age 10. But an age-equivalent score of 9.0 for a 10-year-old predicts an age-equivalent score of 13.5 for him as a 15-year-old, unless he changes his rate of learning. If he was one year behind the national norm at age 10 and also at age 15, he would be learning at the same rate as the average American pupil between ages 10 and 15.

Thus, we should expect that a group of Indian children making an average grade-equivalent score of 4.0 at the beginning of the 5th grade would average 6.4 at the beginning of the 8th grade, and 8.0 at the beginning of the 10th grade level. This may be understood more easily if we speak of average height. A boy may be one inch below the average for his age at 5, two inches below average at 10, and three inches below average at age 15. He is simply growing more slowly than the average all the time.

School achievement is not measured as accurately as height, and one cannot be sure that the units of measurement (age or grade equivalents) are as constant as the units of measurement on a yard-stick. Therefore the actual school achievement scores measured for a particular group of pupils over a span of years seldom fall exactly on a straight line. Irregularities may be due to any of the following factors: the tests used to measure school achievement may be measuring somewhat different aspects of achievement at different ages; the group of pupils used to standardize the test may be more representative of the national group at one age than at another; the particular group being tested may have an unusually good or an unusually poor teacher or school experience during a given year or two, in which case their growth-rate will be greater or less than it had been previously; the particular group being tested may have become more or less motivated to study, in which case their growth-rate will be greater or less than it had been previously.

Are Indian Children Disadvantaged?

It seems clear that many American Indian children are seriously handicapped for success in school due to the family and local community factors that have been mentioned. Therefore, from the point of view of school achievement, it is necessary to say that Indian children, on the average, are disadvantaged. They are disadvantaged because their parents are poor, often illiterate, and inexperienced in the ways of the modern urban-industrial culture. It should go without saying that many Indian children are also advantaged in other ways; their tribal cultures are rich, in some ways, and are in harmony with the natural universe. Many Indian tribes have a satisfying religious and ceremonial life. Family loyalty and family solidarity often give Indian children a sense of security.

But, when speaking of school achievement, socioeconomic facts could lead us to expect that Indian children, on the average, will do poorly in school right from the start, and right on through their childhood and adolescence.

The Facts of School Achievement of Indian Pupils

The evidence on school achievement from several research studies is presented in Tables 1 and 2 and Fig. 2. These particular studies are selected from many, for reasons which will be discussed below. Except for the two sets of data for Sioux children, all studies place Indian children just below the national norms during the first few grades, and then drop substantially below national norms. The data from the two national surveys (Coombs, 1951-54 and Coleman, 1965) are remarkably similar, when allowance is made for the fact that Coombs' study included about 40 percent white children in schools in the same areas as those attended by Indian children. The Coombs study gives a Table (C-2) which separates the Indian from the white children and shows in almost every area and grade that the white children exceeded the Indian children in the test. Therefore, the grade-level data reported in Table 1 and Fig. 2 from the Coombs study would all be reduced (and made more nearly equivalent to those of Coleman) if scores of non-Indians had been excluded.

Effect of Over-age Indian Children on the Data. Interpretation of the test data should take into account the fact that a relatively high proportion of Indian pupils are a year or more above the "normal" age for the school grade in which they are placed. This phenomenon is widely reported, and was confirmed in nearly every one of the Indian school systems studied by us. It results from two facts. First, in BIA reservation schools and many public schools attended by children of non-English speaking families, the child, on entering school at age 6, is placed in a "Beginner" class for the first year where he concentrates on learning English to begin the task of learning to read English. He is promoted to Grade 1 after a year, and therefore is one year over-age if he progresses normally after that time. The other fact is that in most school systems many Indian pupils are "held back" one or more times and thus drop further behind the normal age level for a given grade. They are not promoted generally because of much school absence combined with low school achievement.

Thus, in almost every study of school achievement by Indian pupils, about half are a year or more over-age. But the national norms on the standardized tests they take are based upon a population that is normal for age. For example, the widely used California Achievement tests report norms for a given grade for children who range over an 18-month birth period--nine months on either side of the "normal" birth date. That is, the group for whom the norms for a given grade are computed contains a few children who are 9 months younger than the "normal" age and a few who are 9 months older, but no one is a year older than the "expected" age.

The effect of this on the Indian data is not altogether clear, but it certainly tends to push the Indian scores up slightly, when compared with the national norms. This can be explained in either of two ways. If Indian 5th grade pupils were divided into two groups, those who are within the "normal" age range for which the national norms are computed and those who are older than this age, the over-age group probably exceeds the at-age group somewhat, due to its greater maturity (in spite of being "slow" in school). Therefore the Indian average score is artificially pushed up. Looked at in another way, if the over-age pupils' scores from the 5th grade were added to the scores of the at-age group for the 6th grade (the grade level that would be normal for them), this score would depress the 6th grade average.

This effect is seen clearly in the case of the Rough Rock-Rock Point Navaho data of Table 1. In this case the pupils were grouped by number of years of schooling, and not by their nominal grade level. Since all of them had had a year in "Beginner" class, they were almost a year over-age as compared with most Anglo children. The "expected" grade level (national norm) is compared with the actual grade equivalent on the test, and shows these pupils to be one or more years retarded as early as the end of their second year of schooling. If these pupils had been called First Graders at the end of their second year of schooling, as they are in the usual test programs, they would have been "at grade level" when tested at the end of the first grade, and they would have fallen almost a year behind at the end of the fourth grade.

<u>The "Cross-Over" Phenomenon?</u> The data from a number of testing programs involving Indian children since 1951 appear to be interpreted adequately by the foregoing discussion, with one exception. A study reported by John Bryde(2) concerning the test results on a group of Oglala Sioux pupils on the Pine Ridge Reservation indicated that the Sioux pupils were slightly above national norms at the 4th and 5th grade levels, and then their performance drops to well below the national norms in the 7th and 8th grades. This has been called "the cross-over phenomenon" and has been quoted widely.

Beside the Pine Ridge data, Bryde cites unpublished data from the Aberdeen area office of the Bureau of Indian Affairs to indicate that other Indian children tested in the Dakotas also were above grade level until about the 6th grade level, when their scores fell below national norms.

Bryde attributes great significance to the "cross-over phenomenon." He summarizes the situation as follows: The Sioux children whom he studied generally came from homes and families that were disadvantaged from the point of view of school achievement, and the young children were slow in their initial school learning.

> It takes the young Sioux student about three years to become acclimated to this new situation (school). During this time, which roughly comprises the first three grades, Sioux Indian students, as a group, do not come even close to national norms on standardized tests. At that time, these children thus range from six months to a year and a half behind standardized achievement norms. Their IQs, however, are perfectly normal.
>
> With almost dramatic suddenness, at about the fourth grade, Indian students achieve, and even excel standardized norms. (Aberdeen Area Office, 1965) This "golden age" of achievement often lasts until the seventh grade. At about the seventh and eighth grades, there begins a steady decline in achievement. Bryde, p. 51-52

Bryde goes on to state a hypothesis to explain the "cross-over phenomenon" as follows: "At the age of adolescence, there will be evidence of severe personality deviations and emotional problems on the part of the Sioux Indian students relative to White students of the same age. Rationale: At the age of adolescence, role diffusion (Erikson) and an emerging tendency to alienation (Keniston, Spilka and Bryde) may possibly result in loss of identity, as well as motivational deficiency, causing a drop in achievement." Bryde pp. 54-55.

It would be quite important, from the points of view of educational practice and theory, if this minority group, growing up in families which speak little or no English and generally do not read to their children or otherwise assist them in getting the basic school skills, produced children who were at or above the national norms from age 9 or 10 to age 12 or 14, after which they dropped sharply in school achievement.

Consequently we have analyzed the data presented in Dr. Bryde's doctoral dissertation. Bryde presents California Achievement Test data on 147 eighth grade Indian pupils in the Pine Ridge school who came from eight elementary schools on the Pine Ridge Reservation. These pupils averaged 7.5 grade-equivalent in the autumn of their 8th grade year, when the national norm was 8.2. Many of them were a year or more over-age for their school grade.

Bryde searched the school records in the eight elementary schools from which these students came, and found California Achievement Test data for 119, 73, 107, and 65 of these pupils for grades 7, 6, 5, and 4 respectively. He reported their average grade equivalents for these four grades as follows: 7.0, 6.7, 5.7, and 4.9 respectively.

This is the evidence for the "cross-over" phenomenon.

There are two critical points to raise in connection with the Sioux data. The first has been noted already. A number of over-age children (probably about half of the group) have been included in each grade, and probably have pushed up the average test score for the grade, compared with what it would have been if all children of the "normal" age for this grade had been included in computing the mean score, but no over-age children.

The second point concerns the constitution of the groups in grades 4, 5, 6 and 7 who were compared with the 8th grade group in Bryde's study. Out of 147 eighth graders, only 65 had test data for the 4th grade. Were they representative of the 147 eighth graders? Would it not have been better to sort out these 65 pupils and compare their mean achievement scores at grade 8 with their mean scores at grade 4, in order to test the hypothesis of the "cross-over effect"? Even the 119 seventh grade scores lack 28 pupils who are included in the eighth grade mean. Are these 28 above or below the average of the remainder of their group?

We have written to Dr. Bryde about these matters, and he has replied as follows:

> I studied with much interest your reservations about the cross-over as found among the Sioux students in my study published in 1966. Concerning the three critical points raised in your draft, I regret that they do not appear cogent enough to make one abandon the cross-over phenomenon for this Sioux group. The first point: over-aged children. The majority of the children easily qualified for normal according to the California norms quoted by you--children

who range over an 18 month period--nine months on either side of the "normal" birth date. For the sake of argument, even if these children had been five years over-age and even if the scores were depressed by statistical reworking, these children still show over-achievement then under-achievement--which is the essence of the cross-over--and not just starting out slow and falling further behind as they ascend the grades.

The second point: Were the 65 fourth graders representative of the 147 eighth graders? Also, were the 28 missing seventh graders typical of their group? There seems to be more evidence for a positive response to these questions than for a negative response. In the three instances where Indian groups were separated for comparison, there were no significant differences of achievement: a) between Indian boys and Indian girls; b) among the four degrees of Indian blood; between dropouts and continuing Indians. This remarkable non-significance of differences among all these Indian groups inclines the odds for a similar non-significance for the 65 fourth graders and the 28 missing seventh graders.

Professor Bryde later wrote that he hopes to re-work the data for the 65 fourth graders who were among the 147 eighth graders whose average achievement scores have been reported. This requires a trip to Pine Ridge where his original records are located.

There appears to be no data from other Indian tribes or from other studies of Indian school achievement to support the existence of the "cross-over phenomenon." It has been claimed that the extensive study made by Coombs, et al, in the 1950s gives evidence for a cross-over effect. As noted in Table 1, the Indian group scored 4.3 in the fourth grade, and 5.0 in the fifth grade, against national norms of 4.1 and 5.1 respectively. The older Indian groups were substantially below national norms. In a letter dated July 2, 1969, Dr. Coombs wrote to the present author as follows: "I share with you doubt as to the existence of a 'cross-over' phenomenon for Indian children, although it is certainly true that they do much better by comparison with majority culture children in the lower grades than in the higher ones. . . I have never used the term "cross-over" or thought of it in that way. In any case, the Coleman Report, I believe, shows that much the same thing happens to the children of all disadvantaged groups."

Conclusion. Thus it appears that the soundest interpretation to make of available achievement data for Indian pupils is to suppose that they follow the pattern of other low-income and non-English speaking children. The children drop behind the national norms almost from the start of school.

This explains the fact that the absolute "deficit" in school achievement increases as the pupils grow older. They may be one year behind national norms at the 4th grade, two years at the 8th grade, and 3 years at the 12th grade. Such a finding would indicate that they learn in school at a slower rate than the average for the country, not that they suffer a drastic reduction in rate of learning at or after puberty.

This is not to say that "alienation" and loss of self-esteem do not affect Indian youth, both in school performance and in other ways. But the school performance pattern is probably negatively affected by environmental factors well ahead of the age of puberty, when the alienation factor is thought to come into play.

Future Expectations

In view of the information we now possess about the school achievement and the family socioeconomic circumstances of Indian children, what may we expect in the future? We may expect one thing certainly, and a second conclusion contingently.

We may expect the school achievement of Indian children, on the average, to rise, due to rising socioeconomic status of Indian families. As more Indian youth finish high school and go to college, they will improve their economic position and at the same time contribute more effectively to the success of <u>their</u> children in school. Furthermore, as more Indian parents learn to speak and read English, they will contribute more effectively to the success of their children in school.

The contingent expectation depends on the schools which Indian children attend. Will they do a better job of teaching Indian pupils, no matter what the children's family backgrounds are? They will do so only if the educational profession learns to teach Indian children more effectively and if the educational system supports such efforts.

REFERENCES

1. Bloom, Benjamin S. Stability and Change in Human Characteristics. New York: John Wiley and Sons. 1964.

2. Bryde, John S. The Sioux Indian Student: A Study of Scholastic Failure and Personality Conflict. Ann Arbor, Michigan: University Microfilms. 1965. Also, pp.160-185 in U.S. Senate Special Subcommittee on Indian Education Hearings. Part 1. 1967. U.S. Government Printing Office, 1969.

3. Coleman, James S. et al. Equality of Educational Opportunity. Washington, D.C.: U.S. Government Printing Office, 1966.

4. Coombs, L. Madison; Kron, Ralph E.; Collister, E. Gordon; and Kenneth E. Anderson. The Indian Child Goes to School. U.S. Bureau of Indian Affairs, Haskell Institute, Lawrence, Kansas, 1958.

5. Deutsch, Martin. "The Role of Social Class in Language Development and Cognition." American Journal of Orthopsychiatry 35, 78-88, 1965

6. Erickson, Donald and Henrietta Schwartz, Community School at Rough Rock. Chicago: Department of Education, the University of Chicago, 1969.

7. Havighurst, Robert J. and Rhea R. Hilkevitch, "The Intelligence of Indian Children as Measured by a Performance Scale." Journal of Abnormal and Social Psychology. 39: 419-433, 1944.

8. Havighurst, Robert J; Minna K. Gunther and Inez Ellis Pratt, "Environment and the Draw-a-Man Test: The Performance of Indian Children." Journal of Abnormal and Social Psychology, 41:50-63, 1946.

9. Hess, Robert D. and Shipman, Virginia C. "Early Experience and the Socialization of Cognitive Modes in Children." Child Development. 36, 869-886, 1965.

10. Levensky, Kay. "The Performance of American Indian Children on the Draw-a Man Test." Paper III-2. Final Report, National Study of American Indian Education, 1970.

11. Smartlowit, Stanley (Chairman of Education Committee, Yakima Reservation). "Report on OEO Summer Program at the Yakima Education Camp, 1966." pp. 2038-2076. Hearings before Special Subcommittee on Indian Education of the U.S. Senate. Part 5. 1968. Washington, D.C. U.S. Government Printing Office, 1969.

12. Voyat, Gilbert. "Sioux Children: A Study of Their Cognitive Development." Unpublished paper. Department of Psychology. Yeshiva University, New York City, 1970.

Table 1

COMPARISON OF INDIAN SCHOOL CHILDREN WITH NATIONAL NORMS ON SCHOOL ACHIEVEMENT TESTS

Indian Community	Grade Level Achievement		
	National Norm	Indian Group	Number of Students
Yakima (1966)	4.9	4.0	14
Smartlowit	5.9	4.9	18
	6.9	5.3	17
National Sample (includes 40% white children) Coombs, et al	4.1	4.3	3206
	5.1	5.0	3077
	6.1	5.5	3006
	7.1	6.6	3056
	8.1	7.2	2863
	9.1	7.9	2834
	10.1	9.2	2314
	11.1	9.9	1723
	12.1	10.2	1527
Navaho (Rough Rock and Rock Point) Erickson (Norms based on years of schooling) (1968)	2.9	1.8	61
	3.9	2.7	61
	4.9	3.3	62
	5.9	4.0	45
Pine Ridge (Sioux) (Bryde)	4.2	4.9	65
	5.2	5.7	107
	6.2	6.7	93
	7.2	7.0	119
	8.2	7.5	147
Sioux Elementary Schools (38) in Aberdeen area of BIA. (1965)	4.1	4.3	636
	5.1	5.2	627
	6.1	5.8	667
	7.1	6.9	618
	8.1	7.7	624

Table 2

TEST SCORES OF AMERICAN INDIAN CHILDREN

Grade	Grade levels behind average white students of non-metropolitan areas		
	Verbal Ability	Reading Comprehension	Math Achievement
6	1.3	1.8	1.8
9	1.3	1.9	2.2
12	2.5	2.8	3.0

Source: Coleman: Equality of Educational Opportunity.
Adapted from Tables 3.121.1,2,3

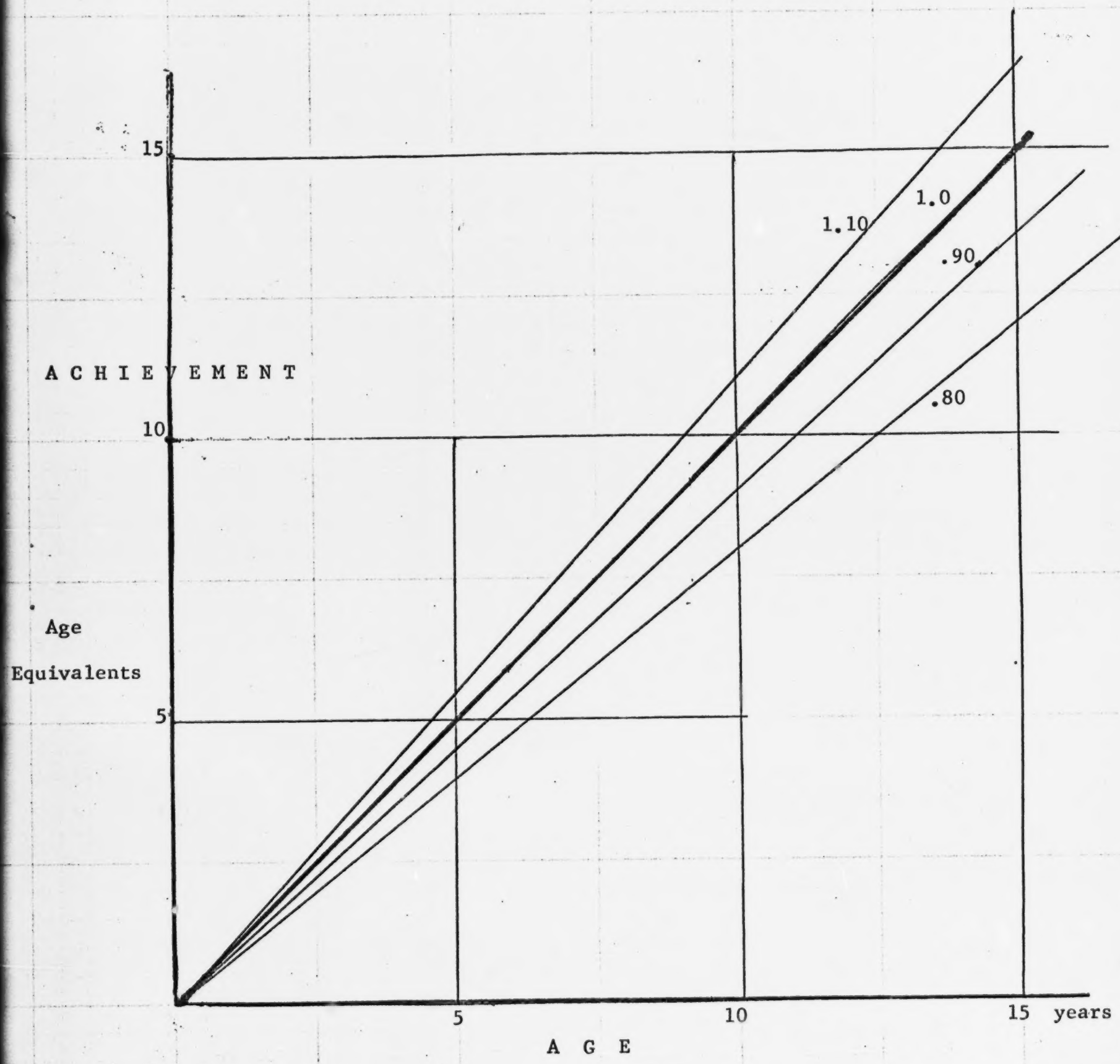

Fig. 1 GROWTH OF SCHOOL ACHIEVEMENT IN RELATION TO AGE

Growth rates are indicated by Quotients, each Quotient represented by a straight line, as shown.

Figure 2

SCHOOL ACHIEVEMENT OF INDIAN PUPILS